

## CLAIMS

1. A method of digitally building up flexographic plates, comprising the steps of:

- a. providing a plate substrate and an imaging surface;
- 5        b. depositing an elastomeric matrix floor onto said plate substrate;
- c. curing said deposited matrix floor;
- d. inkjet imaging one layer on said imaging surface according to pre-stored digital image data;
- e. UV exposing said imaged layer to create a gelled layer;
- 10       f. transferring said gelled layer from the imaging surface to the surface of the matrix floor on said plate substrate;
- g. bonding said gelled layer with the matrix floor; and
- h. repeating steps (d) through (g) until an image of sufficient thickness is created on said plate substrate.
- 15       2. The method of claim 1, wherein said plate substrate forms a sleeve around a plate cylinder of a flexographic printing press.
3. The method of claim 1, wherein said plate substrate comprises a plate cylinder of a flexographic printing press.
- 20       4. The method of claim 1, wherein said plate substrate comprises a metal plate.
5. The method of claim 1, wherein said plate substrate comprises polyester.
6. The method of claim 1, wherein said matrix floor comprises UV curable  
25       material.

7. The method of claim 1, wherein said matrix floor comprises a solvent.

8. The method of claim 7, additionally comprising the step of heating said matrix floor to evaporate said solvent.

9. The method of claim 1, wherein steps (b) and (c) are repeated until a  
5 matrix floor of required thickness is formed.

10. The method of claim 1, wherein said step of curing comprises using a UV source external to said plate cylinder.

11. The method of claim 8, wherein the last deposited matrix floor layer is thin and only partially cured.

10 12. The method of claim 1, wherein said imaging surface comprises one of a cylinder, a blanket and a belt.

13. The method of claim 1, wherein said step of UV exposing comprises using a UV source external to said imaging surface.

14. The method of claim 1, additionally comprising, after said step of  
15 bonding, the step of enlarging the distance between said plate cylinder and said imaging surface to accommodate additional layers.

15. The method of claim 1, wherein said image on the plate cylinder is built in the form of pyramids.

16. The method of claim 1, wherein the top surface of said image on the  
20 plate cylinder comprises an extra tough material.

17. The method of claim 1, wherein said step of depositing and said step of inkjet imaging comprise using liquids based on one of urethane acrylate and methacrylate oligomers.

18. Apparatus for digitally building up flexographic plates, comprising:  
25 a plate substrate for receiving a matrix floor;

curing means for curing said matrix floor;

an imaging surface adjacent said plate substrate;

inkjet imaging means adjacent said imaging surface for ink-jetting an image onto said imaging surface according to pre-stored data;

5 UV exposing means for gelling said image; and

bonding means for bonding said gelled image with said matrix floor.

19. The apparatus of claim 18, wherein said plate substrate forms a sleeve around a plate cylinder of a flexographic printing press.

20. The apparatus of claim 18, wherein said plate substrate comprises a plate cylinder of a flexographic printing press.

21. The apparatus of claim 18, wherein said plate substrate comprises a metal plate.

22. The apparatus of claim 18, wherein said substrate comprises polyester.

15 23. The apparatus of claim 18, wherein said matrix floor comprises UV curable material.

24. The apparatus of claim 18, wherein said matrix floor comprises a solvent.

25. The apparatus of claim 24, additionally comprising heating means for evaporating said solvent from said matrix floor.

26. The apparatus of claim 18, wherein said curing means is external to said plate cylinder.

27. The apparatus of claim 18, wherein said imaging surface comprises one of a cylinder, a blanket and a belt.

25 28. The apparatus of claim 18, wherein said UV exposing means is

external to said imaging surface.

29. The apparatus of claim 18, additionally comprising means for enlarging the distance between said plate substrate and said imaging surface.

30. The apparatus of claim 18, wherein said matrix floor material and said  
5 inkjet ink comprise liquids based on one of urethane acrylate and methacrylate oligomers.

31. A method of printing using a flexographic printing press, comprising the steps of:

- a. providing a plate substrate and an imaging surface;
- 10 b. depositing an elastomeric matrix floor onto said plate substrate;
- c. curing said deposited matrix floor;
- d. inkjet imaging one layer on said imaging surface according to pre-stored digital image data;
- e. UV exposing said imaged layer to create a gelled layer;
- 15 f. transferring said gelled layer from the imaging surface to the surface of the matrix floor on said plate substrate;
- g. bonding said gelled layer with the matrix floor;
- h. repeating steps (d) through (g) until an image of sufficient thickness is created on said plate substrate; and
- 20 i. using said imaged plate for printing on said flexographic printing press.

32. The method of claim 31, wherein said step of using comprises transferring said imaged plate to said flexographic printing press.